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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,889	11/01/2001	Paul Mertens	99,252-A	7630

7590 11/17/2003

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EXAMINER

CHAUDHRY, SAEED T

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 11/17/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

0212

**Office Action Summary**

Application No. 09/998,889		Applicant(s) MERTENS ET AL.	
Examiner Saeed T Chaudhry		Art Unit 1746	

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 August 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-6 and 8-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-6 and 8-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
     a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

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## **DETAILED ACTION**

Applicant's amendments and remarks filed August 28, 2003 have been acknowledged by the examiner and entered. Claims 1, 4-6, 8-16 are pending in this application for consideration.

Rejection under the judicially created doctrine of obviousness-type double patenting has been withdrawn by the examiner in view of terminal disclaimer filed on August 28, 2003.

### **Claim Rejections - 35 USC § 102**

**The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:**

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) he has abandoned the invention.

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

(f) he did not himself invent the subject matter sought to be patented.

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

**Claims 1, 4, 6, 8-9, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Hunze-Concewitz.**

Kunze-Concewitz (5,964,952) discloses a process and apparatus, wherein the substrate is rotated; water is supplied from a nozzle on the substrate; and locally

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heating the part of the substrate surface, while supplying the liquid. The substrate 21 has water 18 sprayed on it via a water lance 46, thus creating a water film 47 on the surface 24 of the substrate 21. Via the water lance 46, the water 18 is fed onto the surface 24 at the center 28, so that the water 18 runs off in the direction of the arrows 48 in the form of a water film 47. At the same time, the spray nozzle 1 sweeps over the surface 24 in the direction of the arrow 27 and sprays steam 16 directly into the water film 47 (see col. 6, lines 46-61 and Fig. 12) A sharply defined liquid boundary is inherently created since the claimed process and the process of Kunze-Concewitz do the same process steps.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 5, 10-11 and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kunze-Concewitz in view of Leenaars et al.**

Kunze-Concewitz was discussed supra. However, the reference fails to specify the rotation speed from 2 to 40 revolutions per second.

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Leenaars et al (5,271,774) disclose a process and apparatus for removing liquid from the surface of a semiconductor. The semiconductor is disposed on a turntable 5. The table is provided with a chamber 6. The table is rotatably arranged in the centrifuge 4 on a rotary shaft 8 (see col. 3, lines 6-20). The wafers are cleaned with usual solutions of HF, NH<sub>4</sub> OH-H<sub>2</sub>O<sub>2</sub> and HCL-H<sub>2</sub>O<sub>2</sub>. The wafer is rotated at a speed of rotation of 5 to 8 rev/sec for cleaning (see col. 4, lines 53-56, col. 5, lines 32-36 and claims).

It would have been obvious at the time applicant invented the claimed process to manipulate the speed of rotation for better and efficient results since Leenaars et al disclose to clean the semiconductor from 5 to 8 rev/sec. One of ordinary skill in the art would use cleaning liquid such as HF, NH<sub>4</sub> OH-H<sub>2</sub>O<sub>2</sub> and HCL-H<sub>2</sub>O<sub>2</sub> as disclosed by Leenaars et al into the process of Kunze-Concewitz. This is because it is well known in the art as disclosed by Leenaars et al to clean semiconductor with these solutions and rise with water after treatment with the cleaning solution. It would have been obvious at the time applicant invented the claimed apparatus to incorporate a chamber which avoid back splashing of the liquid on the surface of a substrate since Leenaars et al disclose a chamber which prevent the splash of liquid from the surface.

**Claim 12 is rejected under 35 U.S.C. § 103 as being unpatentable over Kunze-Concewitz.**

Kunze-Concewitz was discussed supra. However, the reference fails to treat the second side with liquid.

It would have been obvious at the time applicant invented the claimed process to utilize Kunze-Concewitz process for using liquid on second side since Kunze-Concewitz discloses to treat both surfaces with steam as disclosed in col. 5, lines 1-14, since Kunze-Concewitz discloses that both the surfaces are cleaned simultaneously. Further,

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one of ordinary skill in the art would clean the both side with liquid and heat energy to reduce the cleaning time and for faster process.

**Claim 16 is rejected under 35 U.S.C. § 103 as being unpatentable over Kunze-Concewitz in view of Hamada et al.**

Kunze-Concewitz was discussed supra. However, the reference fails to disclose an arm which carries the nozzle relative to the substrate.

Hamada et al (6,106,635) disclose an arm 25a and a nozzle 25 for jetting liquid on the surface. The arm is being movable relative to the surface (see fig. 3).

It would have been obvious at the time applicant invented the claimed apparatus to incorporate the cited arm as disclosed by Hamada et al into the apparatus. This is because Kunze-Concewitz disclose to move the nozzle relative to the turn table.

### **Response to Applicant's Arguments**

Applicant argued that Kunze does not teach creating a sharply defined liquid boundary. In fact, Kunze teaches agitation of the water film with the steam, such that vapor bubbles are injected into the film. Applicants submit the Figure 12, and the corresponding description, teach an agitation process that will result in a dynamic and undefined liquid-ambient boundary, not a sharply defined liquid ambient boundary, as recited in claim 1.

These arguments are not persuasive because in the specification of the instant application in page 4, at lines 9-17 discloses that "heat source can be a nozzle, movable or not, or a static inlet dispensing a heated gas or a heated vapor or a heated mixture of vapor and gas". The applicant's own arguments that kunze sprays steam directly into the water film results in vapor bubbles contradicts with the specification teaching of heating with vapor or mixture of vapor and gas. Kunze utilizes steam to heat

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the water and substrate surface, which is heated vapor and produce a liquid ambient boundary. Therefore, it still reads on the claimed process and apparatus.

Applicant argued that Leenaars is directed to a method for removing of a liquid in a centrifuge chamber. Applicants note that Leenaars does not describe local heating to create a sharply defined liquid ambient boundary, as described in claim 1.

This argument is not persuasive because Kunze rotate the substrate while treating with the steam nozzles 33 (see Fig. 6) to remove liquid from the center towards the edge of the substrate. Leenaars discloses to rotate the substrate on a turntable for the removal of the liquid from the substrate in different speeds of rotation, i.e. 5, 8, 17 and 50 rev/sec. Therefor, there is a reasonable expectation of success for the removal of the liquid and contaminants from the surface of the substrate by rotating the substrate and manipulating the rotation speed for the best results.

Applicant's arguments with respect to claims 13 and 14 that they are directed to an apparatus for removing a liquid from a surface of a substrate where a heat source and a liquid are positioned such that, at least locally, a sharply defined liquid-ambient boundary is created on a surface of the substrate. Because the combination of Kunze and Leenaars would produce an apparatus that agitates a liquid on a surface of substrate located in a centrifuge chamber.

This argument is unpersuasive because it contradict with the specification which teaches heating with vapor or mixture of vapor and gas (see page 4, lines 9-17 and page 5, lines 21-25).

Applicant argued that Hamada does not describe an apparatus where local heating is used create a sharply defined liquid-ambient boundary.



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This argument is not persuasive because Hamada is recited to show a nozzle on a movable arm, which is known in the art to remove contaminants efficiently from a surface of a rotating substrate.

Applicant's arguments filed August 28, 2003 have been fully considered but they are not deemed to be persuasive.

Applicant's amendment necessitated the new grounds of rejection. Accordingly, THIS ACTION IS MADE FINAL. See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

***Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saeed T. Chaudhry whose telephone number is (703) 308-3319. The examiner can normally be reached on Monday-Friday from 9:30 A.M. to 5:00 P.M.***

***If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Randy Gulakowski, can be reached on (703)-308-4333. The fax phone number for non-final is (703)-872-9310 and for after final is 703-872-9311.***

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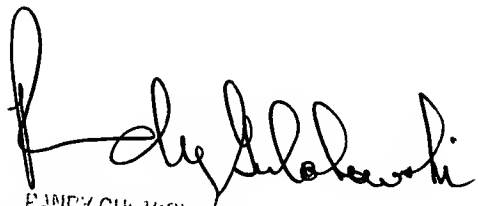
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***Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0651.***

**Saeed T. Chaudhry**

***Patent Examiner***

***November 7, 2003***

  
RANDY GULANSKI  
SUPERVISORY PATENT EXAMINER  
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